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ABSTRACT

Covering the period January 1 through June 30, 1975, this second semi-annual report on the Applied Fishery Science Program operative at Sheldon Jackson College in Sitka, Alaska presents information regarding program progress and Alaska Native students involved in science education. Specifically, this report details: Planning and Coordination (permit application, curriculum coordination with other universities advertising and student recruitment, funding sources); Academic Program and Placement Service (curriculum development, first year enrollment, and placement service); Aquaculture Facilities (site selection, hatchery and weir, and wet lab and classroom preparation); Advisory Services (information dissemination and contact record). A program summary is also provided indicating: state-wide liaison has been established with Native groups, educators, consultant firms, fisherman organizations, and private hatcheries; direct assistance has been given to fisheries programs of the Tlingit and Haida Central Council, the Metlakatla Island Reserve, the Aleut League, and the Bristol Bay Native Association; the two-million egg campus gravel incubation hatchery is expected to go into operation in the fall of 1975 as one of the first private hatcheries in Alaska; the multiple credential fisheries program is based upon parallel fisneries curricula in other colleges and input from Alaska fisheries agencies and Native leaders. (JC)

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SHELDON JACKSON COLLEGE FISHERIES PROGRAM

RC009909

DEVELOPMENT OF AN APPLIED FISHERIES SCIENCE PROGRAM FOR NATIVE ALASKANS AT SHELDON JACKSON COLLEGE SITKA, ALASKA

SECOND PROGRESS REPORT

1 July 1975

Submitted by

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A. Financial Report, Fiscal Year 1975

B. Revised Membership, Technical Advisory Committee

C. Program Planning Schedule

D. Sheldon Jackson College Curriculum and Course Description

E. Staff Resumés

REPORT SUMMARY

1. All aspects of program implementation for the first fiscal year are on or ahead of the planning schedule approved by the technical advisory committee.
2. State-wide liaison has been established with many Native groups, educators, consultant firms, fisherman organizations, and private hatchery entrepreneurs.
3. Direct assistance has been given to fisheries programs of the Tlingit and Haida Central Council, the Metlakatla Island Reserve, the Aleut League, and the Bristol Bay Native Association.
4. The two-million egg campus gravel incubation hatchery is expected to receive all necessary agency sanctions for full operation this fall as one of the first private hatcheries in Alaska.
5. All hatchery and teaching facilities will be operational by September 1, 1975.
6. A multiple credential fisheries program has been designed based on parallel fisheries curricula in other colleges and with input from Alaska fisheries agencies and Native leaders.
7. The first year enrollment of 14 students consists of 10 technician students and 4 transfer students. Traditional late enrollment may increase this number by September.
8. Groundwork for cooperative curriculum development has been established with the University of Alaska.

9. Foundation seed money has been supplemented by funds from the Sheldon Jackson College spring fund drive, a National Science Foundation curriculum development grant, and a donation from the Tlingit and Haida Central Council. Future funding sources are being explored with the assistance of Senator Ted Stevens and Senator Mike Gravel.

10. The ability to motivate more Native students toward science careers may be a deciding factor in eventual program success.

The Northwest Area Foundation has provided Sheldon Jackson College with a grant to establish an Applied Fishery Science Program designed for the needs of Alaska Native groups participating in salmon ranching. This is the second semi-annual report which covers the period between January 1 through June 30, 1975. The 1975 fiscal year financial report is given in Appendix A.

BACKGROUND

The 1974 Alaska Private Non-profit Salmon Hatchery Act enabled aquaculture development in private sectors. Native groups,having land claim settlement benefits, are looking to salmon enhancement projects as investments which are consistant with their traditional life style. Trained aquaculture technicians, however, are not readily available in Alaska, and since no higher educational institution in Alaska provides salmon aquaculture training, Sheldon Jackson College (SJC) has initiated a program to meet this need.

Central to the program is a 2-million egg pink and chum salmon gravel incubator on campus near Indian River. This incubator will serve as a student training facility as well as a demonstration model for the economic feasibility of salmon ranching in Alaska.

The SJC program was conceived at the suggestion of Dr. William McNeil, Chief of the Anadromous Fishes Investigations at the National Marine Fisheries Service (NMFS) Auke Bay Laboratory. Under Dr. McNeil's guidance, and with input from Native leaders and state fishery agencies, the program was formulated

with the following four objectives:

1) To promote Native Alaskan education; that is, to provide an educational career ladder for Indians, Aleuts, and Eskimos so that what they learn can be transferred to a meaningful and rewarding life experience.

2) To improve salmon fishing; that is, to establish a private salmon hatchery at the College to produce fish for the common property fisheries and to demonstrate the feasibility of salmon ranching as a source of self-sustaining funds for the program.

3) To promote cooperation between public and private organizations involved in the orderly development of salmon ranching.

4) To provide technical advice and assistance to various Native and non-Native entrepreneurs who will be closely following the results of this program.

To help guide program directions, a technical advisory committee was formed (see Appendix B for revised committee membership). This committee met in November of 1974 and approved a program planning schedule which outlines tasks, specific jobs, time lines, and evaluation criteria (see Appendix C).

PROGRAM PROGRESS

The first two quarters of the program (July through December, 1974) produced preliminary directions and working contacts with key agencies and Native groups. Support of constituents was excellent. All aspects of program execution

were on or ahead of schedule. The second two quarters - this report period - have witnessed the same steady progress: again, all elements of program implementation are on or ahead of schedule.

Accomplishments to date will be presented under the four primary tasks defined in the planning schedule:

1) Planning and Coordination
2) Academic Program and Placement Service
3) Aquaculture Facilities
4) Advisory Services

PLANNING AND COORDINATION

Four areas of activities will be described under this section:

1) Permit application
2) Curriculum planning
3) Advertising and student recruitment
4) Funding sources

Permit Application

Private salmon hatcheries are without precedence in Alaska; and consequently permit application procedures are being established for the first time. Since SJC may be the first operational private hatchery in the state, our efforts will probably be used as a model for future applicants.

Permit application entails extensive planning on design, construction, and operation of hatchery and weir facilities. This planning is now completed

and is discussed under the section on Aquaculture Facilities. Other details are outlined in the table below:

Purpose of the permit	Agency	Status
Operation of private salmon hatchery and two seasonal weirs (at Indian River and at Katlian River, South Fork)	Alaska Department of Fish and Game (ADF&G)	Provisionally approved on 29 May 1975. Public hearing scheduled for July 24, 1975 in Sitka, Alaska.
The operation of seasonal weir at Indian River (Home stream)	U.S. Park Service (USPS)	Permit issued on 30 May 1975
Operation of seasonal weir at Katlian River, South Fork (donor stream)	U.S. Forest Service (USFS)	Application being processed and should be issued before August 1.
Approval for hatchery effluent treatment procedures and for methods of salmon carcass disposal	Alaska Department of Environmental Conservation (DEC)	Under evaluation; response expected shortly.

Based on agency feedback, all sanctions should be forthcoming in time for full program implementation this fall.

Curriculum Coordination With Other Universities

To assure a meaningful educational experience for SJC fishery students, particularly transfer students, our curriculum will be coordinated with offerings at other universities. Since the University of Alaska (UA) is developing a new fishery science curriculum at its Juneau campus, it is now in an excellent position to participate in a tranfer program with SJC. Several of our transfer students have already indicated a preference to remain in Alaska for their third and fourth years of college.

The first half of 1975 saw a tremendous increase in cooperative activities

between SJC and UA. In many instances, these activities were unprecedented. A summary follows:

1) SJC served as a center of operations for UA Marine Advisory Program (MAP) which conducted workshops in Sitka.
2) The UA Arctic Environmental Information and Data Center provided logistical support and furnished technical information requested by SJC on behalf of the Sitka Trollers Association.
3) SJC participated in the UA MAP annual program review conference at Anchorage.
4) The UA MAP is exploring possible short-term Marine Science Education offerings at SJC for primary and secondary school marine biology teachers.
5) The UA Sea Grant Program has offered (pending funding) to locate one half-time MAP agent on the SJC campus to teach fisheries courses.
6) Mr. Clint Atkinson, special fishery consultant to the UA President Dr. Robert Hiatt, visited Sitka to consult with the SJC fisheries staff on curriculum coordination. As a result of this visit, ground work was set up for future cooperative academic developments.
7) At the request of SJC, UA in Sitka will offer two courses (Basic Construction and Equipment Maintenance and Operation) required in the SJC Aquaculture Technician program.

Advertising and Student Recruitment

The SJC fisheries program has gained state-wide exposure over the last two quarters via four contact methods:

1) Letter campaign
2) Recruiting and consulting trips
3) Participation in conferences and workshops
4) Media coverage

Letter Campaign

An intensive letter campaign was conducted in the spring to advertise the program and to invite enrollment from interested persons. The target groups included the following:

1) Native corporations
2) Native leaders
3) Educators and high school counselors
4) The Alaska Native Brotherhood camps
5) Alaska Federation of Natives personnel
6) Fisherman groups

These letters generated enthusiastic response throughout the state, resulting in a number of requests by high schools and Native groups for student recruitment and consultation visits.

Recruiting and Consulting Trips

Personal visits were the most productive form of communication; but frequency and duration of trips were limited by staff time, travel funds, and very often by convenience of flight connections. Therefore, the number of towns visited was curtailed.

A site visit included, whenever possible, a visit to the high school, a town-hall meeting, an appearance on public media, and consultation with Native leaders. Towns which were visited included the following:

Sitka (home base)	Metlakatla
Pelican	Craig
Hoonah	Cordova
Juneau	Anchorage
Wrangell	Dillingham
Ketchikan	Bethel

All but one of the above towns were visited in response to an invitation.

Participation in Conferences and Workshops

The staff was invited to speak at the following events:

1) The first meeting of the American Fisheries Society, Alaska Chapter, 10 January 1975, Juneau.
2) The Tlingit and Haida Central Council's program planning and evaluation workshop, 26 February 1975, Wrangell.
3) The Alaska Rural Development Conference, 13 March 1975, Juneau.
4) The Environmental Protection Agency Water Quality Workshop, 22 March 1975, Sitka. The director served as moderator for the panel on "Pollution and Its Effects on Fish and Wildlife."

5) The Bristol Bay Native Association (BBNA) Comprehensive Employment Training Act (CETA) Career Workshop, 25 April 1975, Dillingham.

Presentations were also given for local Sitka organizations such as the Lions, Rotary, the National Historical Park, the Association of American Foresters, and the Chamber of Commerce.

The staff was invited to participate in the following meetings:

1) The Alaska Review Conference for the National Fish Plan, April 30 - May 1, 1975, Juneau.
2) The Southeast Alaska Curriculum Development Workshop, 16 May 1975, Sitka.

Exhibits were displayed in the following meetings:

1) The EPA Water Quality Workshop, 22 March 1975, Sitka.
2) The Tlingit and Haida Central Council Annual Convention April 8 - 10 1975, Sitka.

In addition, an exhibit will be set up at the annual Alaska State Fair in Haines during August.

Media Coverage

All the news media have provided outlets for program advertisement. The staff appeared on radio and television shows in Sitka, Juneau, and Bethel. A feature article on the program appeared in the March issue of the Southeast

Alaska Log, and the United Fishermen of Alaska (UFA) newspaper is preparing a report on the progress of SJC as one of the first private salmon hatcheries in Alaska.

Funding Sources

One stipulation in the award of the foundation grant was for the program to become self-sustaining after foundation funding ceases. Accordingly, one of the program objectives is to demonstrate the potential financial returns from salmon ranching.

Salmon ranching, however, is a high risk business. Moreover, the build-up of spawner returns from a transplanted stock will likely be slow, and the number of surplus fish returning beginning in 1977 may not be sufficient to carry the total program cost. Therefore, other funding sources will be needed until the salmon hatchery can produce on a regular basis.

Funding sources can be divided into two types: immediate and potential.

Immediate Sources

The following sources havebeen secured or are readily available:

1) The spring SJC fund drive
2) National Science Foundation (NSF) curriculum development grant
3) A $25,000 Tlingit and Haida Central Council donation
4) Student tuition

SJC held a successful fund drive this spring, which listed the College matching funds to the fisheries program as one of the primary objectives.

A grant from the National Science Foundation to upgrade the instructional facilities of the SJC science divisior alloted about $7,000.00 to the fisheries program for the development of fresh and salt water systems and for teaching equipment.

Tuition for each SJC student is $1,800 per year; thus, a full enrollment will bring substantial income to the program.

During the spring Tlingit and Haida Central Council convention in Sitka, a contribution of $25,000 was given to SJC without stipulation. The College has indicated that a portion of this money can be made available to the fisheries program if needed.

Potential Sources

The search for potential funding received the support of the two senators from Alaska, Senator Ted Stevens and Senator Mike Gravel. Inquiries to these legislators began with a request for information on the National Aquaculture Act of 1975 (H.R. 15036, introduced by Congressman Chappell).

Senator Gravel supplied us with a copy of H.R. 15036 and suggested direct contact with the Department of Commerce for funding possibilities. He offered the assistance of his office on future inquiries.

Senator Stevens also provided information on H.R. 15036 and, in addition, contacted these potential funding sources on our behalf:

1) The National Marine Fisheries Service
2) The Department of Health, Education and Welfare
3) The Department of Labor

Based on these inquiries, contacts were established with the State Director of Vocational Education and the Commissioner of Labor. Follow-up efforts are under way.

ACADEMIC PROGRAM AND PLACEMENT SERVICE

In developing a multiple-credential program to provide meaningful employment opportunities for Alaska Natives, information on technical aquaculture education and on requirements for a conducive learning environment were compiled.

Our efforts began in the first two quarters with a "Lower 48" site visit by Mr. Dennis Lund, our instructor-coordinator, to applied fisheries science colleges, state hatcheries, and the Lummi Indian School of Aquaculture. In the last two quarters, background research continued with Alaska fishery officials and Native leaders. In addition, the following areas were addressed:

1) Curriculum development
2) First year enrollment
3) Placement service

Curriculum Development

Based on information from the "Lower 48" trip and with additional input from the Alaska Department of Fish and Game (ADF&G) on technical qualifications for various fish culture positions, Mr. Lund has developed a multiple credential program which can offer a degree or certificate for both one and two years of training. The curriculum and course description are described in Appendix D.

First Year Enrollment

At this date, fourteen students have enrolled in the technician and transfer program; ten are new students (all enrolled in the technician program) and four are second year SJC students (all enrolled in the transfer program). Out of the ten new students, six are Native (one Eskimo, three Tshimshian, two Tlingit). Given the recruitment efforts, the enrollment at this date is disappointing. Possible reasons for the low response will be addressed in the last section of this report. However, the number may increase before September because inquiries and requests for application forms are still being received and some potential students have not yet made a final decision.

Placement Service

Perhaps the most important feature of the SJC program - next to the quality of the academic program - is the effectiveness of the placement service. This is particularly true for the Native graduate who will be seeking employment with predominantly non-Native employers.

To help the transition from schooling to employment, ground work is being laid for a job placement service. In the past, students have had good success in locating part-time and permanent job opportunities with ADF&G, NMFS, and USFS. This year, one of our new students is already working with the ADF&G fish culture facility in Sitka under a cooperative SJC-ADF&G program.

The outlook, therefore, appears very optimistic for our graduates two years from now, particularly when the private hatchery programs are initiated by Native and non-Native groups.

AQUACULTURE FACILITIES

In order to propagate pink and chum salmon (our target species) as well as such subsidiary species as coho salmon and shellfish, the following facilities are being constructed:

1) a 2-million egg gravel incubator
2) two seasonal weirs
3) a teaching wet lab
4) a classroom/dry lab

In the first two quarters, activity was centered on site selection and facility design. The last two quarters have been spent on construction. At this date, hatchery construction and weir prefabrication are almost completed and preparation for the teaching wet lab and classroom are underway -- all facilities are expected to be operational by this fall. Details on our construction progress are described in the three following sections: 1) Site selection 2) Hatchery and weir and 3) Wet lab and classroom preparation.

Site Selection

Construction began after the Sage Building site was selected as the central area for all facilities (see Figures 1 and 2). The gravel hatchery will be constructed on Sage Point; the wet lab and classroom will be housed inside Sage Building.

Hatchery and Weir

Hatchery and weir facilities can be separated into three catagories:

1) Water delivery system

2) Netarts model gravel incubator

3) Weirs

The Water Delivery System[1/]

The gravel incubation hatchery and the wet lab will operate on Indian River water drawn from the College hydroelectric flume and piped to the Sage Building area via a buried 6-inch PVC line (see Figure 1). Water delivery at the hatchery will be 520 gallons per minute (gpm) at zero pounds per square inch (psi) and 300 gpm at 10 psi. Hatchery and wet lab operations require 300 gpm. At the incubators, water will pass through each series of troughs and empty into a common outlet channel which is plumbed to emergency gas and electric recirculation pumps.

A sea water delivery system is being built and will be plumbed into the hatchery and wet lab sometime next spring. This system will allow propagation and experimentation with marine species.

Netarts Model Gravel Incubator

The 2-million egg Netarts model gravel incubator (see Figure 3) consists of twenty-four 4 foot by 8 foot plywood units (with two four-foot compartments

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1/ Design of the water delivery system was aided by the Juneau consultant firm Environaid and by engineers at the Alaska Lumber and Pulp Co. of Sitka.

per unit) having a capacity of about 80,000 eggs per unit. Fertilized eggs will be placed on four plastic screen egg trays stacked above a shallow layer of gravel covering the tank bottom. Water flow will be guided by removable baffles to produce an upwelling flow plattern through each compartment. Hatched sac fry will drop onto gravel substrate for completion of development.

Weir

In a normal hatchery operation, only one weir is required to trap spawners on the hatchery (home)stream. However, our hatchery stream - Indian River - is a depleted stream[1/] which cannot supply brood stock in sufficient numbers. Therefore, a donor stock is necessary and two weir operations are needed.

Traditionally, transplanting stocks from one area to another has resulted in many more failures than successes. Therefore, donor stock selection and fertilization procedures were carefully developed with the assistance of NMFS geneticist Mr. Jack Helle and ADF&G biologist Mr. James Parker.

Our selected donor source (Katlian River, South Fork) is a river ten miles from Sitka. Two million pink and chum salmon eggs will be taken from this stream for hybridization with Indian River males, a procedure documented recently in Canada.[2/]

1/ The 1974 Private Non-profit Salmon Hatchery Act restricts hatchery location to depleted streams.

2/ Bams, Rob 1974. A transplanting method incorporating cross-breeding in pink salmon. In: Proceedings of the 1974 Northeast Pacific Pink and Chum Salmon Workshop. Vancouver, British Columbia.

Wet Lab and Classroom Preparation

Concurrent with hatchery and weir construction, Sage Building is being renovated for the use of the fishery program. The basement is being converted into a wet laboratory which will house various models of indoor gravel incubators and student project facilities and will also serve as the support facility for the outdoor incubation system. The classroom/dry lab located on the first floor is being furnished with lab desks, shelves, and audio visual teaching aids. Teaching facilities are expected to be operational on or before September 1, 1975.

ADVISORY SERVICES

The program has pledged advisory services to interested Native groups and other entrepreneurs on 1) aid in feasibility studies, 2) assistance in permit application, 3) recommendation of outside consultants, and 4) provision of trained personnel (graduates). Emphasis is placed on the last two items.

The staff has diverse fish culture backgrounds (see resumés in Appendix E). However, since aquacultural problems generally require expertise from many disciplines, and because of the highly variable biological and political conditions around the state, constituents should interpret disseminated information under local situations and with assistance from local scientific personnel.

Information Dissemination

To prepare for information dissemination, our hatchery development - both facility construction and permit application - is being carefully documented.

Available information on various aspects of aquaculture is also being organized. Already, questions have been received on problems ranging from oyster culture in Halibut Lagoon to salmon propagation procedures.

Contact Record

In the last two quarters, cooperative efforts on aquaculture development have included activities with the following groups:

1. The SJC fisheries staff is serving as technical advisor to the Tlingit and Haida Central Council on their hatchery development program at Sandy Bay, south of Sitka. Direct assistance has been given with preliminary site assessment efforts by Mr. Chet Mattson, NMFS fishery consultant to THCC.

2. Active cooperation has been maintained with the Aleut League. During a trip to Anchorage this spring, the director gave an informal seminar for the Aleut League staff on aquaculture technology and provided a series of slides for the League's student recruitment efforts in the Aleutian Chain and Alaskan Penninsula.

3. The SJC staff has been serving as technical and educational advisors to the Sand Point High School in the Aleutians in the development of its new aquaculture curriculum.

4. The director of the CETA program of the Bristol Bay Native Association(BBNA) visited SJC for a two day fact-finding trip for aquaculture potential at Bristol Bay. The SJC program director later attended a BBNA Career Workshop in Dillingham in which he served as a liaison person between state fishery officials and members of the Native Association.

5. This program has kept a close contact with the salmon enhancement plans of the Metlakatla community. In March, the director visited the community and reviewed hatchery development plans with community leaders and the Federal fisheries officer for the island, Mr. Dave Houseworth.

6. Calista Corporation in Bethel has requested cooperation with SJC on potential fisheries developments in the Kuskokwim area. Our staff may participate in a Rural Development Conference in Bethel in July.

7. Leaders of the Alaska Federation of Natives were consulted for guidelines to Native science education. Mr. Gordon Jackson, Executive Vice-President of AFN, gave special assistance to us by passing out program information directly to each of the Alaska Native Corporation presidents who are members of his board.

Other requests for information have come from the following groups:

Consultant firms:

Kramer, Chin and Mayo of Seattle
Trych, Nyman and Hayes of Anchorage

Native groups:

Cook Inlet Native Corporation
Eyak Corporation of Cordova
Chenaga Corporation of Cordova
Tatitlek Corporation of Cordova

Others:

Office of the Governor of Alaska
United Fisherman of Alaska
British Petroleum
Career Center of Anchorage

NATIVE STUDENTS IN SCIENCE EDUCATION

Although program implementation has been on schedule and without major conflicts, one basic problem needs to be addressed: Many Native students avoid the area of science in their studies.

During the last fiscal year, much time and effort were spent in an attempt to attract Native students into the fisheries curriculum. Our efforts were greeted with enthusiastic support by practically every community and Native organization. Yet, few students have committed themselves to the program.

The problem does not lie in the lack of committment by the parent organization, for they were genuinely concerned about securing trained personnel. Certainly, there is no identification problem with the resource since fisheries have always been a vital part of the livelihood of Alaska Natives. The students we spoke to showed great interest in fishery biology. Hence the question: Why the paucity of applicants?

One possible source of the problem surfaces from time to time -- the fear that science curricula have too much math and chemistry. We have attempted to allay this apprehension by emphasizing learning by doing rather than by rigid classroom lectures. But the fear remains. It seems the only solution is to strengthen the science preparation in the primary and secondary levels.

Another possible problem is the present emphasis among Natives on positions such as social leaders, lawyers and educators, rather than careers

in science. As in most societies, the interests, needs, and values of adults are not necessarily shared by youth.

A simple solution to this problem is not evident. Some approaches, however, have had desirable effects.

Perhaps the most potent motivating factor is the presence of Native instructors. Mr. Henry Davis and Mr. A.P. Johnson, two prominent Native instructors on the SJC staff, inspired respect and pride from many of our Native students who even came to class with cameras.

Community support is another factor of which the Metlakatla community can be used as an example. Our presentation to high school students there was preceeded with short supportive speeches by the mayor, the community planner, the Federal fishery officer, and the high school counselor. That session resulted in three students enrolling from this community.

While many other factors contributed to our difficulties in attracting Native students, the central issues of basic science preparation, community encouragement and Native instructors should be addressed in order to gain real progress in Native participation in fishery science.

ACKNOWLEDGEMENT

The SJC Fisheries staff extends our special thanks to all the federal, state and local agency personnel involved in various aspects of our program implementation. Without their enthusiastic support, our progress would have been much less than what we are pleased to report at this time.

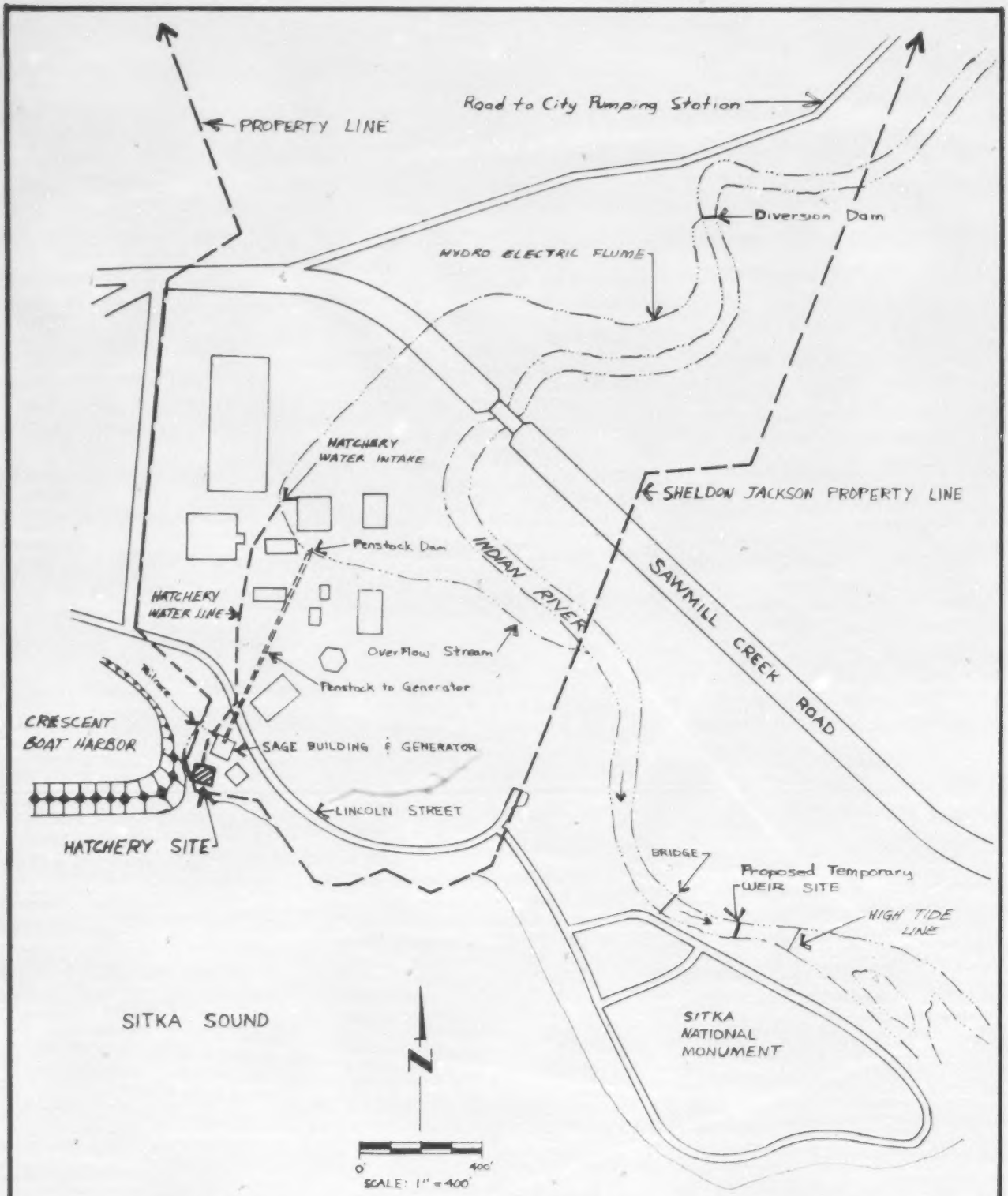


FIGURE 1 - CAMPUS HATCHERY SITE

AQUACULTURE PROGRAM
SHELDON JACKSON COLLEGE
GRAVEL INCUBATION HATCHERY

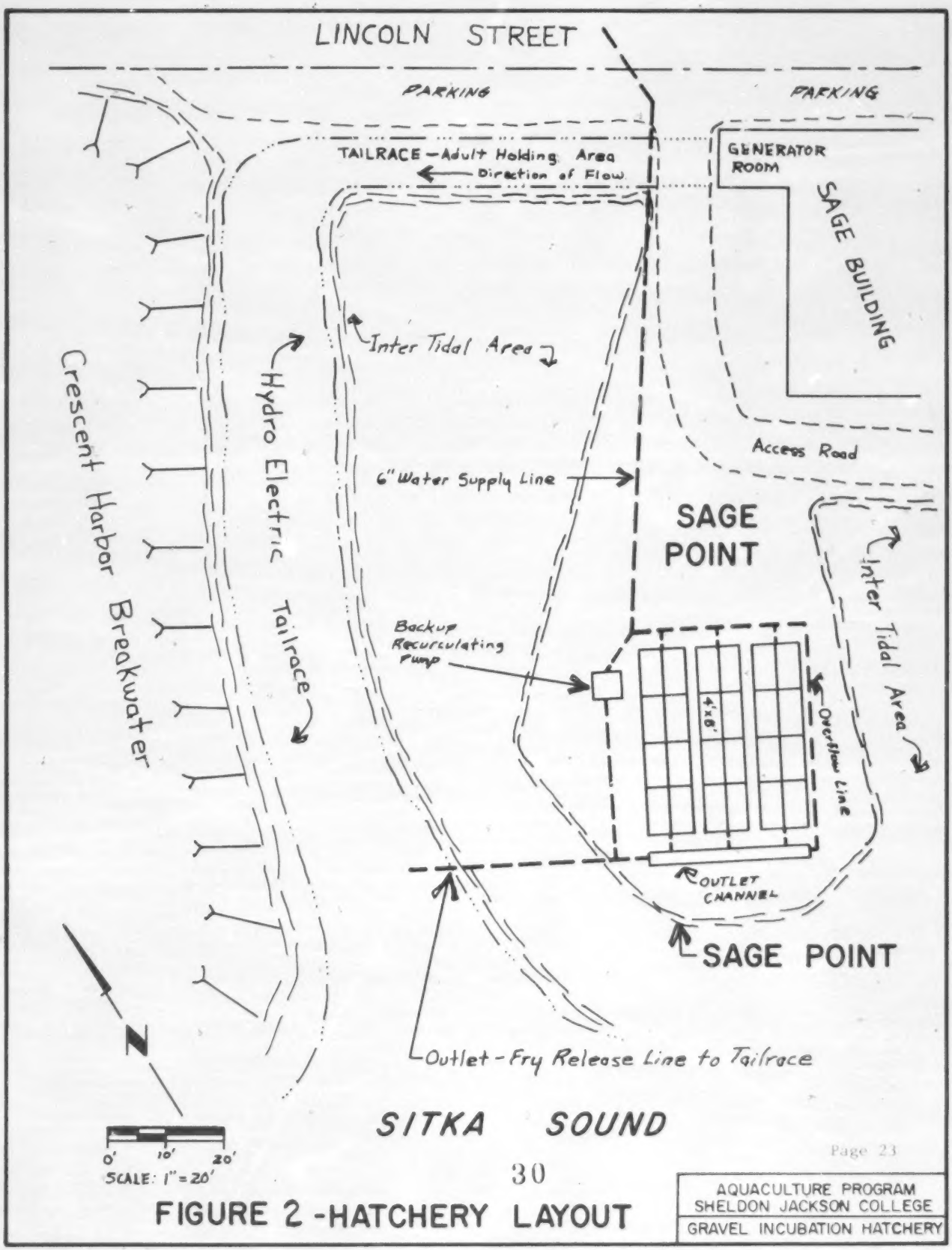
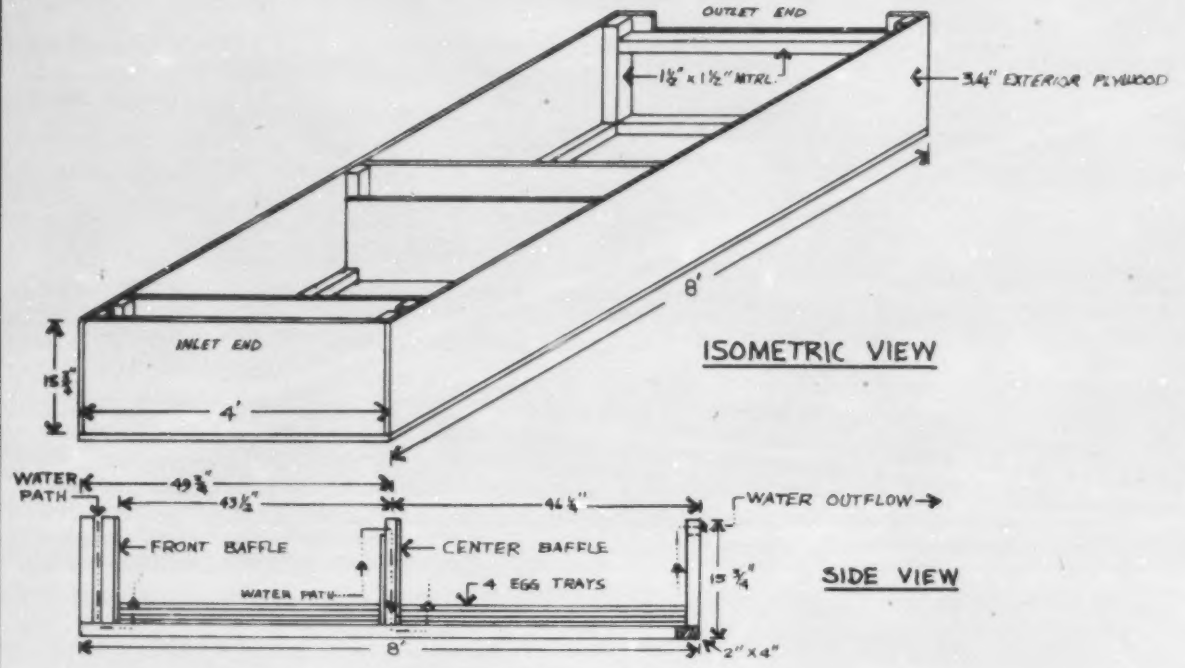
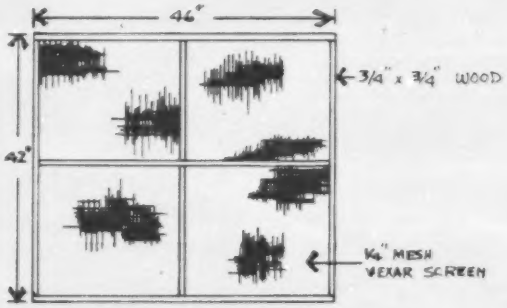


FIGURE 2 - HATCHERY LAYOUT

AQUACULTURE PROGRAM SHELDON JACKSON COLLEGE
GRAVEL INCUBATION HATCHERY



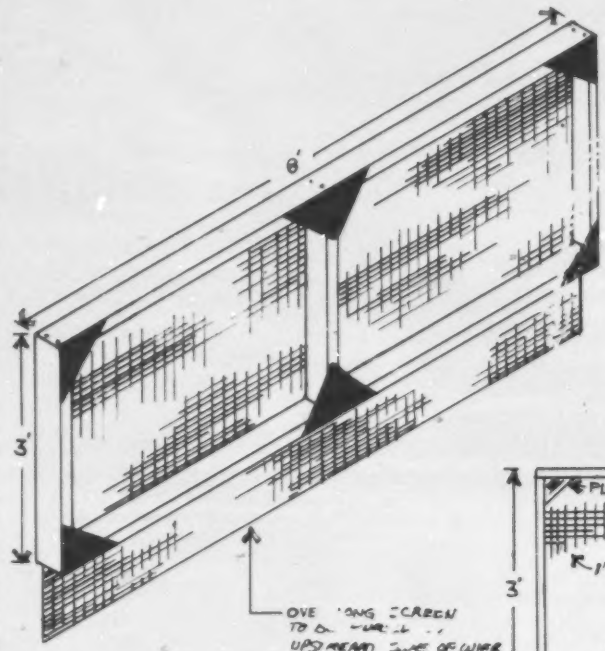
TOP VIEW



EGG TRAY DETAIL

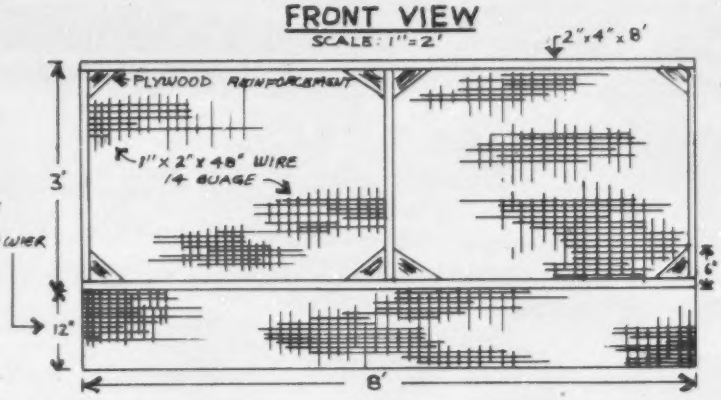
FIGURE 3 - NETARTS GRAVEL INCUBATOR UNIT

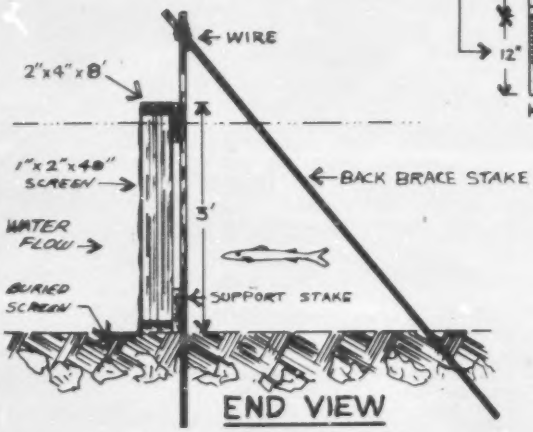
AQUACULTURE PROGRAM
SHELDON JACKSON COLLEGE
GRAVEL INCUBATION HATCHERY



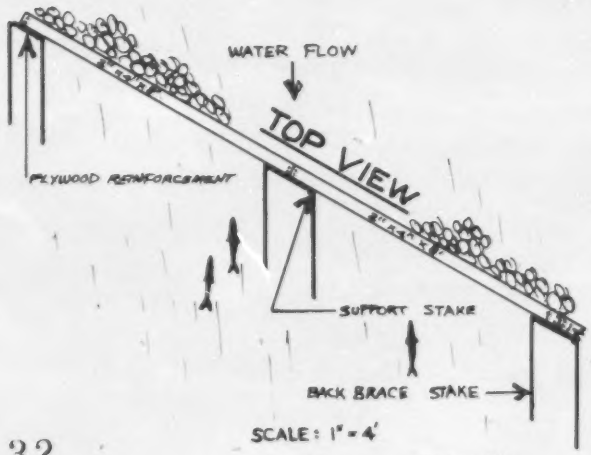
ISOMETRIC VIEW
SCALE: 1"=2'

FRONT VIEW
SCALE: 1"=2'





END VIEW
SCALE: 1"=2'



SCALE: 1"=4'

FIGURE 4
INDIAN RIVER WEIR
CONSTRUCTION SPECIFICATIONS

AQUACULTURE PROGRAM
SHELDON JACKSON COLLEGE
GRAVEL INCUBATION HATCHERY

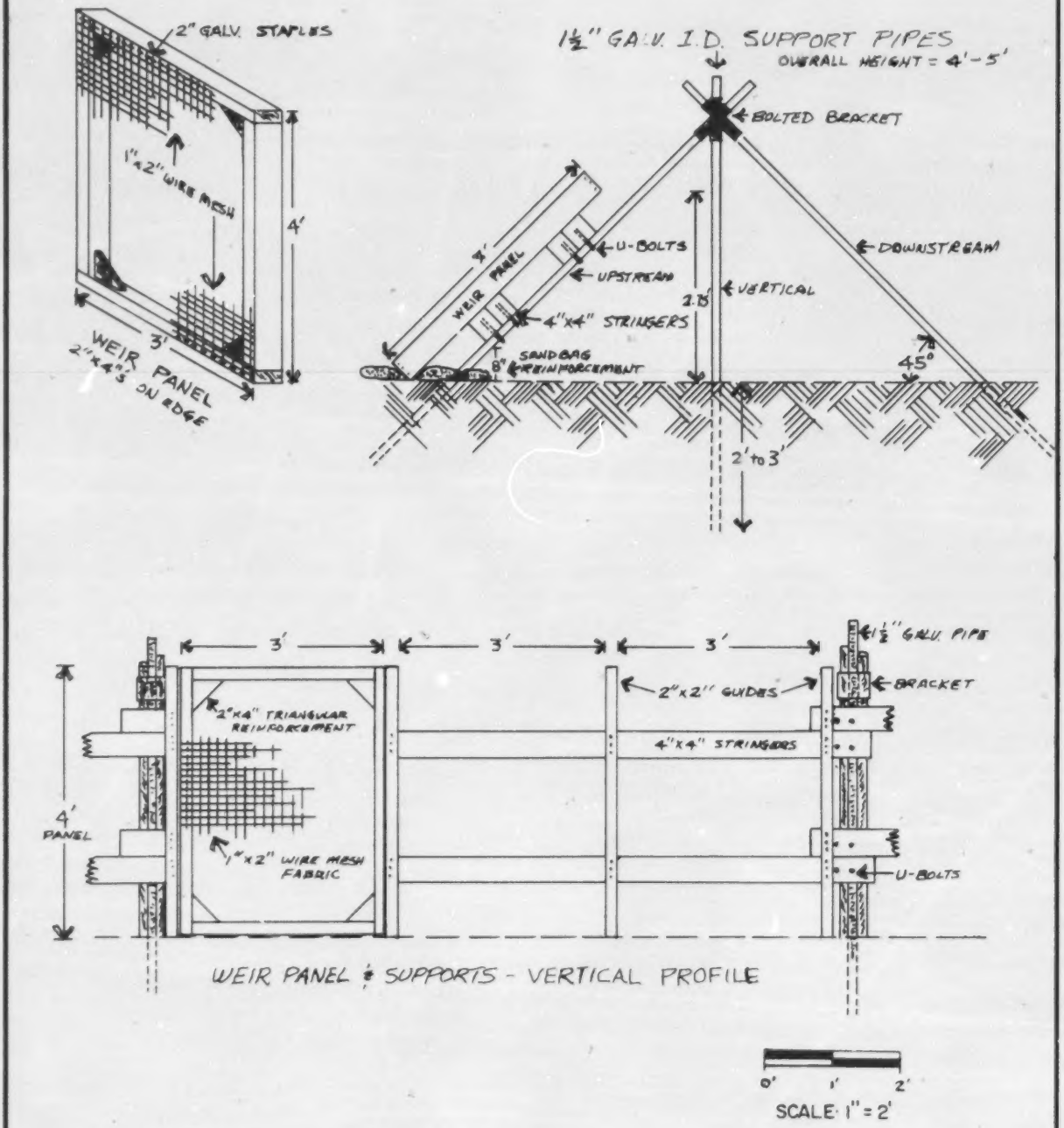


FIGURE-5 CONSTRUCTION, WEIR FRAME AND SUPPORTS (katlian Weir)

AQUACULTURE PROGRAM
SHELDON JACKSON COLLEGE
GRAVEL INCUBATION HATCHERY

APPENDIX A

FINANCIAL REPORT - FY 1975

	Budgeted				
	Original	April 1, 1975 Revision	Spent	Encumbered	Spent plus Encumbered
I Salaries					
Foundation	36,900	36,900			
Matching	6,800	6,800			
Total	43,700	36,742.06	36,742.06 1/		36,742.06
Fringe					
Foundation	6,273	6,273			
Matching	1,156	1,156			
Total	7,429	5,057.79	5,057.79 1/		5,057.79
II Equipment 2/					
A. Site clearance for gravel incubators	3,000	2,000	1,719.70	682.12	2,401.82
B. Piping and Installation(pumps)	10,000	11,500	7,314.92	4,213	11,527.92
C. Incubation system(gravel)	7,000	6,730	5,368.05	1,700	7,068.05
D. Heath and other incubators and troughs	1,400	1,500	492.21	640	1,132.21
E. Weir and spawning shack materials	6,500	5,950	5,029.38	1,000	6,029.38
F. Instruments for incubator system	700	700	208.37	387.40	595.77
G. Instructional equipment	1,000	1,650	140.45	1,510.	1,650.45
H. Freight	800	1,000	0 3/	1.000	1,000
I. Wet teaching lab construction and equipment	0	11,500 4/	8656.40	2,808	11,464.40
J. Contingency funds	0	4,000	0	4,000	4,000
Total for Equipment	30,400	46,530	28,929.48	17,940.52	46,870

			Budgeted				
			Original	April 1, 1975 Revision	Spent	Encumbered	Spent plus Encumbered
III	Travel		2,000	2,000	1,964.84	0	1,964.84
IV	Other:		5,000	5,000	4,695.16	0	4,695.16
	Visiting lecturers						
	Native Instructor						
	Student Assistants						
	Secretary						
	Consultant Fees						
	Teaching Material						
	Phone						
	TOTAL	Foundation	80,573				
		Foundation plus matching	88,529	95,329.85	77,389.33	17,940.52	95,329.85

1/ Based on a 12 month salary plan, this figure includes payments for July and August. Unexpende money transferred to equipment budget per revision request of April 1, 1975.

2/ Equipment budget is supplemented with unexpended salary ($6,957.94) unexpended fringe ($2,371.21), and $7,148.31 from a National Science Foundation grant. Total supplement equals $16,477.46.

3/ Freight has been paid by Sheldon Jackson College and will be billed back to the program.

4/ This figure was $9,500 under the April 1, 1975 revision request. The upward adjustment to $11,500 was necessitated by increased cost for material and services.

APPENDIX B

REVISED MEMBERSHIP

TECHNICAL ADVISORY COMMITTEE

CHAIRMAN: Dr. William J. McNeil, Chief
Anadromous Fishes Investigations
National Marine Fisheries Service
Auke Bay

MEMBERS: Mr. Greg Argel
Development Planner
Metlakatla Island Reserve
Town of Metlakatla

BIA Representative

New Director
Native Studies Program
Sheldon Jackson College

Mr. Richard Eliason
State Representative
Sitka

Mr. Ed Halvorson
Deputy Director
Office of Development Planning
Tlingit and Haida Central Council
Juneau

Mr. Dave Houseworth
Fisheries Consultant to the Metlakatala Island Reserve
Division of Fisheries Science
Ketchikan

Mr. Mark Jacobs, Jr.
Member
Board of Directors
SEALASKA Corporation
Juneau

Mr. Chester Mattson
Supervisory Fisheries Research Biologist
National Marine Fisheries Service
Auke Bay

MEMBERS:

Mr. John McMullen
Supervisor
Southeast Region
Fisheries Rehabilitation, Enhancement, and Development Divison
Alaska Department of Fish and Game
Juneau

Dr. Richard Nevé
Coordinator of Shore Programs
Professor of Marine Science
University of Alaska
Seward

Mr. Charles Olson
President
Alaska Native Brotherhood
Camp #1
Sitka

Mr. James Parker
Area Management Biologist
Alaska Department of Fish and Game
Sitka

Mr. Mike Perensovich
Wildlife and Fisheries Biologist
United States Forest Service
Sitka

Mr. George Pletnikoff
Director of Aquaculture Programs
Aleut League
Anchorage

Mr. Edwin Scholz
Assistant to the President for Advancement
Sheldon Jakcon College

Mr. Robert Thorstenson
President
Petersburg Fisheries, Inc.
Petersburg

TABLE 1. -- PLANNING SCHEDULE FOR SHELDON JACKSON AQUACULTURE PROGRAM, PAGE 1
(Second Draft - 11/19/74)

APPENDIX C

Primary Task	Specific Job	Quarters 1st	2nd	3rd	4th	5th	6th	7th	8th
1.0	Planning and coordination								
	1.1 Establish technical advisory committee	X	----	X					
	1.2 Schedule meetings of technical advisory committee		X				X		X
	1.3 Develop rehabilation and enhancement plans for management of Indian River salmon stocks	X	----	X					
	1.4 Apply for hatchery-weir operation and construction permits from Alaska Dept. of Fish and Game, U.S. Park Service, and other agencies	X	----------	----------	X				
	1.5 Design multiple credential academic program			X					
	1.6 Develop cooperative academic programs with UA and other universities							X	---- X
	1.7 Develop advertising and student recruitment plans	X	----	X					
	1.8 Develop habitat improvement and protection plan for Indian River watershed and estuary - to be submitted to the U.S. Park Service and the U.S. Forest Service			X	-------	X			
	1.9 Develop long range funding plans						X	--------	X
	1.10 Submit progress reports to Hill Family Foundation			X		X		X	
	1.11 Submit grant renewal proposal to Hill Family Foundation							X	
	1.12 Evaluate process and program				X				X
	1.13 Evaluate adult salmon returns beginning 1977								

Criteria For Evaluation:

1. Adherence to proposed work schedule.
2. Receipt of necessary permits for private salmon aquaculture facility.
3. Agency evaluation of Indian River salmon stock management plans.
4. Evaluation of multiple credential academic program by advisory committee and outside consultants.

TABLE 1. -- PLANNING SCHEDULE FOR SHELDON JACKSON AQUACULTURE PROGRAM, PAGE 2
(Second Draft - 11/19/74)

APPENDIX C

Primary Task	Specific Job	Quarters 1st 2nd 3rd 4th 5th 6th 7th 8th
2.0	Academic program and placement service.	
	2.1 Employ academic staff	X
	2.2 Research and consult on stepladder approach to Native aquaculture and fisheries education	X--------X
	2.3 Survey anticipated job openings and required training pre-requisites	X---X X---X
	2.4 Establish enrollment goals by credential categories	X
	2.5 Recruit students	X-------X X-------X
	2.6 Design improved SJ fisheries program	X---X
	2.7 Initiate new multiple credential aquaculture and fisheries curriculum	X
	2.8 Establish on-the-job training programs with agencies and industries	X----------X X-------X
	2.9 Design placement service to aid graduates in job hunting and university transfer program	X-------X

Criteria For Evaluation:

1. Adherence to proposed work schedule.
2. At least 15 students enrolled in technician and transfer programs for first academic year.
3. At least 15 students received on-the-job training at the college or with an agency.
4. At least 75 percent of graduates placed in full-time aquaculture and fisheries related employment.
5. Credit hours completed by students equal to at least 12 units per student per semester.

TABLE 1. -- PLANNING SCHEDULE FOR SHELDON JACKSON AQUACULTURE PROGRAM, PAGE 3
(Second Draft - 11/19/74)

APPENDIX C

Primary Task	Specific Job	Quarters 1st	2nd	3rd	4th	5th	6th	7th	8th
3.0	Aquaculture facility								
	3.1 Employ staff	X	---	X					
	3.2 Site analysis and selection	X	---	X					
	3.3 Research and consult on available gravel incubator models	X	---	X					
	3.4 Develop construction plans for hatchery and weir	X	-------	-------	X				
	3.5 Construct hatchery			X	-------	-------	X		
	3.6 Construct and operate weir				X	-------	-------	X	
	3.7 Operate hatchery					X	-------	-------	X
	3.8 Release pink/chum migrants								X
	3.9 Evaluate propagation possibilities for coho salmon	X	-------	-------	X				
	3.10 Submit proposal to ADF&G and other funding agencies for coho propagation program			X					
	3.11 Evaluate propagation possibilities for sockeye and chinook salmon and shellfish							X	------- X
	3.12 Evaluate and improve facilities							X	--- X

Criteria for Evaluation:

1. Adherence to proposed work schedule.
2. At least 800,000 pink/chum eggs stocked and at least 80 percent of eggs stocked released as fry.
3. At least 15 students receiving training at facility.

TABLE 1. -- PLANNING SCHEDULE FOR SHELDON JACKSON AQUACULTURE PROGRAM, PAGE 4
(Second Draft - 11/19/74)

APPENDIX C

APPENDIX C

Primary Task	Specific Job	Quarters 1st 2nd 3rd 4th 5th 6th 7th 8th
4.0	Advisory Services	
	4.1 Organize information for dissemination	X--------X
	4.2 Inform interested Native groups on available services	X--------X
	4.3 Provide services	X----------X
	4.4 Demonstrate hatchery methods	X----------X
	4.5 Modify information dissemination through continuing assessment of salmon ranching in Alaska	X----------X
	4.6 Seminars for information and education of SJ students and general public	X---X

Criteria for Evaluation:

1. Number of requests and responses for technical assistance and trends in frequency of contacts.
2. Number of visitations by constituents and trends in visitations.
3. Attendance at seminars and qualitative analysis of success.
4. Evaluation of advisory services by technical advisory committee.

APPENDIX D

FISHERIES TECHNOLOGY CURRICULUM

The Fisheries Technology curriculum is designed to prepare students for employment as technicians in private and government fish hatcheries. Course work will emphasize practical hatchery techniques, applied fish biology, lake, stream, estuarine ecology, and water quality. Basic English, math and chemistry will also be taught. In addition to lectures and laboratory exercises, students will learn hatchery techniques by assisting with the operation of the College's salmon incubators and by conducting field projects in Sitka-area lakes and streams. Enrollment will be limited to 15 students in 1975-76.

FIRST YEAR

Fall		Interim		Spring	
Course	Units	Course	Units	Course	Units
Ocean Ranching Technology 101	3	*Social Science Elective	4	Ocean Ranching Technology 102	5
Biology	4			Fish Biology 100	4
*College Math	4			*English	4
*English	4			Equip. Maintenance and Operation	3
Basic Construction	2			*Physical Education	1
*Physical Education	1				
	18				17

Completion of one year of the Fisheries Technology curriculum earns the student a one-year Certificate of Completion.

SECOND YEAR

Fall		Interim		Spring	
Course	Units	Course	Units	Course	Units
Advanced Fish Culture 200	4	Commercial Fishing Technology	4	Marine Biology	4
Fishery Science 201	4			Fisheries Field Project 202	3
Physical Science	4			Statistics	4
*Christ and Culture	4			Report Writing	3
*Health	2			*Philosophy/Religion Elective	4
	18				18

Completion of the entire two-year program will earn the student an Associate in Science degree. If the student completes all of the courses listed except those marked with an asterisk, he will receive a Certificate of Completion of two years of Fisheries Science Technology Training, but will not be eligible for an Associate in Science degree.

FISHERIES TECHNOLOGY COURSE DESCRIPTIONS

FISH 100 — Fish Biology

Fish anatomy, physiology, life history, distribution, classification and growth. Empasizes fish biology as it effects hatchery operations. Prerequisite: Biology 103 or 113.

FISH 101 — Ocean Ranching Technology I

Basic hatchery techniques for rearing Pacific salmon to release as fry or smolt. Trapping fish, artificial spawning, egg handling, gravel incubator operation, pen rearing techniques, hatchery sanitation, release of fry and smolt. Hatchery tool construction and use. Students will assist with spawning fish and operation of campus hatchery. Students will conduct their own hatchery fish rearing projects and will make field trips to state and federal hatcheries and research facilities. Prerequisites: Biology 103 or 133 previously or concurrently, admission to Fisheries Technician Program.

FISH 102 — Ocean Ranching II

Continuation of FISH 102

FISH 200 — Advanced Fish Culture

Advanced fish culture techniques including hatchery site selection, intensive culture systems, feedlot rearing, water quality analysis, fish nutrition, fish diseases, non-salmonid fish culture, invertebrate culture. Students will assist with operation of campus hatchery. Prerequisites: Fish 100, 101

FISH 201 — Fishery Science

Fisheries literature, fish ecology, and population dynamics, natural processes and ecology of streams and lakes, fisheries sampling methods and equipment, political and sociological aspects of commercial and sport fishery management. Prerequisites: Biology 103 or 113, Math 93, Fish 101.

FISH 202 — Fisheries Field Project

Students will use fisheries training to select, plan, carry out and evaluate individual projects in fisheries biology, ecology, fish culture, either in the field, the hatchery, or the laboratory. Prerequisites: 1 year of Fisheries Technology and permission of instructor.

TECH 50 — Basic Construction

Basic carpentry, hand and power tools use, small scale wood, metal, and plastic fabrication, basic plumbing, hydraulics, concrete work, surveying. Prerequisite: Math 93 previously or concurrently.

TECH 55 — Equipment Maintenance and Operation

Small engine maintenance and operation, boat handling, electric and gasoline motors and pumps, outboard motor troubleshooting and repair, basic electricity. Prerequisite: Math 93 previously or concurrently.

FISHERIES SCIENCE TRANSFER CURRICULUM

The Fisheries Science transfer curriculum is designed to prepare students for transfer to a four-year college where they plan to complete a Bachelor of Science degree in Fisheries. Course work emphasizes biology, mathematics, and chemistry with electives in fisheries. Students completing this curriculum will receive an Associate in Science degree.

Depending on the high school background of the student and the levels of biology, chemistry and mathematics achieved at Sheldon Jackson College, Fisheries transfer students may be able to transfer directly to the junior year of a four year fisheries school. Most modern bachelor's degree fisheries programs, however, require mathematics through calculus and chemistry through organic chemistry in the first two years. Therefore, students should realize that it may take more than four years to achieve a bachelor's degree if they are weak in these subjects.

Suggested First Year Courses

Fall		Interim		Spring	
Course	Units	Course	Units	Course	Units
Biology	4	Commercial Fisheries Technology	4	Biology of Commercially Important Fish and Shellfish	4
Physical Science	4			College Algebra and Trig.	4
College Algebra	4			English	4
English	4			Religion	4
Physical Education	1			Health	2
	17				18

Suggested Second Year Courses

Fall		Interim		Spring	
Course	Units	Course	Units	Course	Units
Biology	4	Social Science Elective	4	Elective	4
Chemistry	5			Biology	4
Report Writing	3			Chemistry	5
Philosophy/ Religion Elective	4			Statistics	4
Physical Education	1				17
	17				

APPENDIX E.

STAFF RESUMES

Derek Poon - Director until July 1, 1975; Program consultant in FY 76.

Mr. Poon received his Bachelor of Arts degree in Zoology from the University of California at Berkeley, his Master of Science in Fisheries from Oregon State University, and is currently preparing a Ph.D. dissertation for Oregon State University on the evaluation of salmon gravel incubators at Netarts Bay, Oregon, and at Little Port Walter, Southeast Alaska.

Mel Seifert - New Director.

Mr. Seifert received his B.S. degree with distinction from Iowa State University, his M.S. degree from Cornell University. His background includes seven years of research experience with rainbow trout, other fin fishes, shellfish, and small mammals. For the last five years he was the hatchery manager responsible for research and production for trout and salmon at Marine Protein Corporation, Redersburg, Pennsylvania.

Dennis Lund - Instructor-Coordinator.

Mr. Lund received his Bachelors and Masters degrees from Oregon State University. Prior to coming to the Aquaculture Program, Mr. Lund was involved in the design, construction, and operation of a large raceway system, freshwater hatchery, and food production plant for commercial rearing of salmon and trout in Oregon. He also has research experience in culture of oysters and production of oyster seed.

David Bright - Hatchery supervisor and teaching assistant.

Mr. Bright received his Associate in Arts degree in Fish Technology from Mount Hood Community College. For the last two years, he was hatchery foreman of Oregon Aqua-Foods Wright Creek Hatchery.